

REMARKS

Claims 10 to 12 and 16 are pending in the application, of which claims 10 is independent. Favorable reconsideration and further examination are requested.

On page 2, the Office Action states that the “application admits of illustration by drawing”. However, that is not the case. The specification does not include mention a drawing. Accordingly, we respectfully submit that a drawing is not necessary and, therefore, traverse the requirement that a drawing be submitted.

Next, the subject matter of claims 11 and 12 can be found in original claims 2 and 3, which make up part of the disclosure of the original application (see the original translation). Accordingly, withdrawal of the objection to the disclosure is respectfully requested.

Turning to the art rejection, claims 10, 11 and 16 were rejected over Inoue et al. (U.S. 5,118,982); and claims 12 to 15 were rejected over Kikko (JP 04-074777A). In particular, amended independent claim 10 recites ceramic layers comprising a hard piezoelectric material that has a general composition of $\text{Pb}[(\text{Zr}_x\text{Ti}_{1-x})_{1-y}(\text{Mn}_{1/3}\text{Nb}_{2/3})_y]\text{O}_3$, and an electrode layer comprising copper, where the electrode layer is disposed between the ceramic layers. The applied art is not understood to disclose or to suggest at least these features.

In this regard, the Office Action states the following with respect to claim 15:

Regarding claims 13-15, the Examiner takes Official Notice that it is well known in the art to replace part of the Pb with low valence cations. It is old and known in the art to improve the piezoelectric characteristics of a dielectric material by replacing Pb with cations, such as Mn, Nb, La.

Therefore, it would have been obvious at the time of the invention was made to improve the piezoelectric characteristics of the PZT films by replacing some of the Pb with other cations.

We, however, note that neither Inoue nor Kikko discloses using Mn or Nb as a dopant for PZT ceramic. Official notice, however, was taken that it is well known to improve piezoelectric characteristics by replacing Pb with Mn or Nb. Even if this were the case (a point which we do not concede), there is certainly no disclosure or suggestion in the art to combine the elements in the particular proportions set forth in claim 10, namely $Mn_{1/3}Nb_{2/3}$. According to the Applicant, the specific replacement of parts of Zr and Ti by a mixture of Mn and Nb in the claimed ratio (namely, $Mn_{1/3}Nb_{2/3}$) produces advantageous properties in the resulting ceramic material. For example, the resulting ceramic material has a good quality factor (Q_m), reduced dielectric loss, and provides an increased electromechanical coupling coefficient. Accordingly, the claimed composition, in the context of a piezoelectric transformer, is believed to provide patentable advantages.

For at least the foregoing reasons, claim 10, and its dependent claims, are believed to be allowable over the art.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

In view of the foregoing amendments and remarks, we respectfully submit that the application is in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience.

The undersigned attorney can be reached at the address shown below. All telephone calls should be directed to the undersigned at 617-521-7896.

No fee is believed to be due for this response; however, if any fee is due, please apply it to deposit account no. 06-1050 referencing attorney docket no. 14219-085US1.

Respectfully submitted,

Date: November 20, 2008

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